



Addressing Barriers to Renewable Energy Procurement

In association with the EPA Green Power Partnership

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CORPORATE GOALS

Corporations are increasingly interested renewable energy. The primary reasons for this are as follows:

1. COST

- Lock in long-term fixed pricing
- Reduce exposure to commodity price swings
- Gain certainty in planning / site selection decisions

2. RISK MANAGEMENT

- Energy security
- Reduced emissions profile
- Regulatory changes

3. DIFFERENTIATION

- Customer retention and expansion
- Comply with customer demands (ex: supplier scorecards)

4. CORPORATE SOCIAL RESPONSIBILITY

- “Right thing to do”
- “Nice to Have” but won’t trump economic requirements

CORPORATE APPROACHES TO RENEWABLE ENERGY

There are three ways for companies to participate in the renewable energy markets:

1. REC / CARBON PURCHASES

- Widely adopted by companies in all industries
- Difficulties in providing additionality (growth of market)
- Purchases are a pure cost

2. ON-SITE GENERATION

- Generally outside of a companies core competencies
- Requires available land and co-location with good renewable resource
- Locks a companies into a specific location for the life of the renewable project

3. ENERGY OFFTAKE AGREEMENTS

- Enter into a wholesale Power Purchase Agreement with a specific project
- Projects need not be point of load and can be located in areas of greatest resource
- Rapidly being adopted by leading companies / organizations
- Locks in price of power
- Locks in price for RECs / offsets

ANATOMY OF A WHOLESALE POWER PURCHASE AGREEMENT

- 1** Company signs a long-term power purchase agreement for renewable power from a distributed project.
- 2** Power from the distributed project is sold directly into the grid for the local price at the point of production.
- 3** Company buys power directly from the grid for the local price at the point of use.

COMPANY



1

WIND FARM



2

GRID



3

EXAMPLE: GOOGLE TRANSACTIONS

Google was one of the first companies to publicly sign long term renewable energy power purchase agreements as a method to green their corporate footprint.

1. STORY COUNTY II WIND FARM – 2010

- Located near Ames, IA
- Google purchased 114 MW of 150 MW
- 20-year fixed price contract
- Power sold to MISO, REC's retained by Google
- Offset for Council Bluffs, IA datacenter

2. MINCO II WIND FARM – 2011

- Located near Oklahoma City, OK
- 101 MW farm built exclusively for Google
- 20-year fixed price contract
- Power sold to SPP, REC's retained by Google
- Offset for Pryor Creek, OK datacenter



April 29, 2011 | Revision 2

Google's Green PPAs: What, How, and Why

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Introduction

Google has pledged to reduce its carbon footprint to zero. Zero is an aggressive goal, not easily achieved by any one measure, so we pursue a multi-pronged approach to get there. Efficiency is one prong of the approach and carbon offsets is another. But a very important third prong of the approach is the purchase and use of carbon-free renewable electricity to power our data centers.

When we started out on this path, we realized that we had a lot of learning to do. We had basic questions, such as:

- What types of resources are most appropriate, and from where?
- How do we get the electricity to our facility to use?
- How can we make such a purchase economical, and how can it be leveraged to protect us from higher prices in the future?
- How can we maximize the impact of our green power purchases on our carbon emissions and global emissions?

We also knew we wanted to enforce some fundamental principles that we value:

First, our activities must meet the basic criterion of "additionality." We'll describe this more a bit further down, but fundamentally, a renewable energy purchase is additional if it has an effect in the real world, be it direct or indirect. A direct effect would be causing a new renewable project to be built. An indirect effect would be increasing demand for renewable energy such that market pressures are able to encourage new investment.

Second, when possible, our projects should go beyond basic additionality and directly address problems that limit the growth of the renewable industry. For example, if we know that we are going to need renewable energy for a long time, it may be better for renewable project developers if we commit to a long-term contract rather than purchasing as we go, because it makes it easier for them to raise capital.

This paper attempts to show how we have answered these questions and met our principles in a way that makes business sense for us. We hope also that this will serve as a useful starting point for other companies that want to buy renewable power.

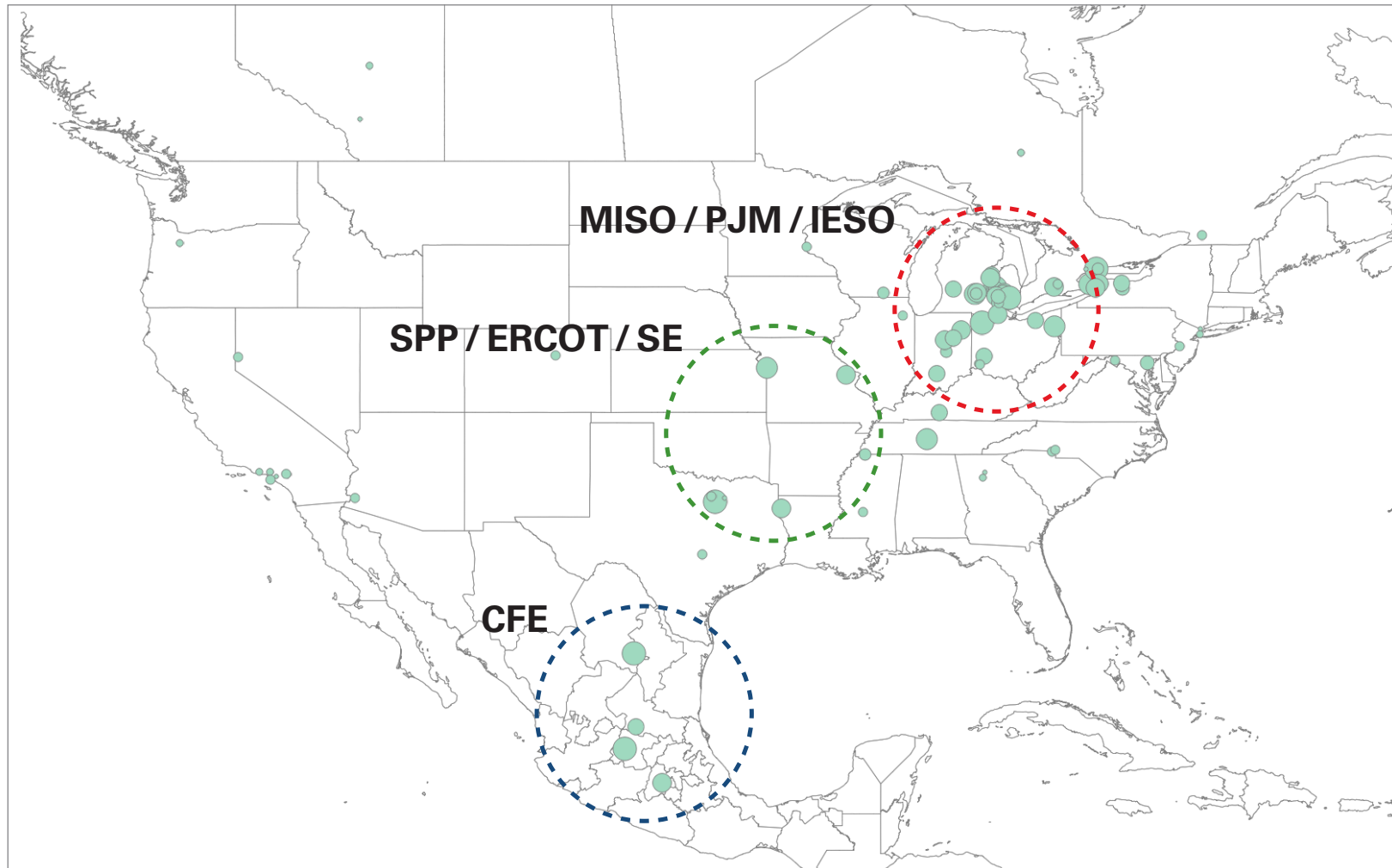
Electrons, markets, and the art of the possible

Electrons

First, a little background: We know from Kirchhoff's circuit laws that electricity generated in one spot cannot be directed to a specific user over the electricity grid. Once you put electricity on the grid there is no actual way to know "the energy from wind farm X is going to my data center Y."

PORTFOLIO APPROACH

Leading companies are beginning to think of their load requirements as a portfolio.

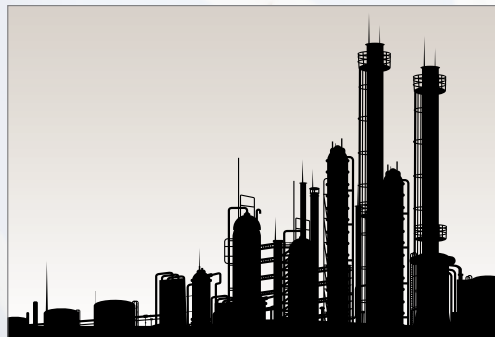


SUPPLY PORTFOLIO

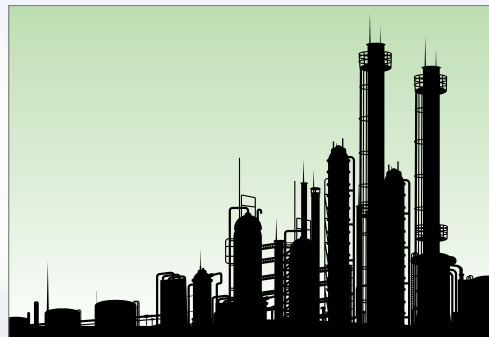
The portfolio approach reduces cost by creating economies of scale.



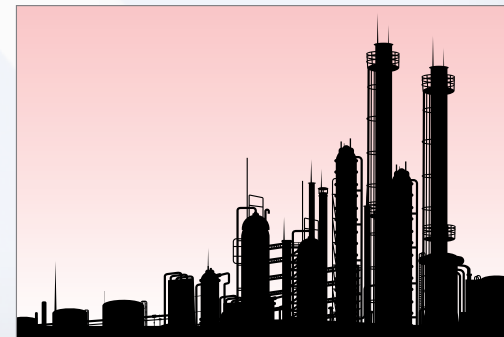
SUPPLIER
600,000 MWh



FACILITY 1
Demand required, 150,000 MWh



FACILITY 2
Demand required, 200,000 MWh



FACILITY 3
Demand required, 250,000 MWh

CHALLENGES OF EXECUTION

While there are obvious benefits associated with the use of renewable energy, there are some common challenges that companies have encountered when attempting to identify appropriate solutions:

1. MEETING THE NEEDS OF INTERNAL STAKEHOLDERS

- Must be aligned with corporate objectives
- Multiple departments are involved (ex: facilities, legal, accounting)

2. MARKET ACCESS

- Fragmented universe of potential suppliers and “offerings”
- Time consuming process (RFP)

3. MARKET CLARITY

- Quality of developers, technologies and projects varies greatly
- There are many factors that can influence long-term performance

INTERNAL STAKEHOLDERS

To be successful, a project must be fully aligned with the needs of each internal stakeholder. It is critical to identify these needs before approaching the market.

Altenex creates detailed customer profiles that outline the selection criteria and targets for each internal stakeholder.

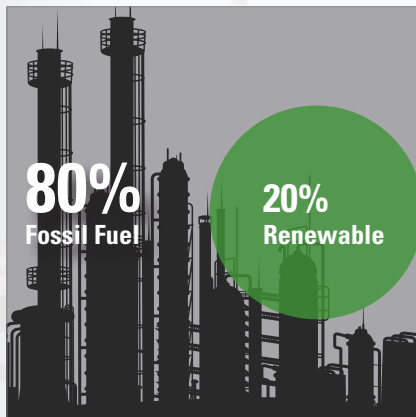


MARKET ACCESS

There are over 1500 renewable energy projects in the US market. The price, quality and stage of these projects varies greatly. Identifying the right operating asset is critical in order to capitalize on the benefits that including renewable energy in your power portfolio can provide.

Altenex has created a proprietary database that contains detailed information on over 500 developers and nearly 2000 projects. Customer profiles are matched against the database to identify which projects meet their selection criteria.

TARGET POWER PORTFOLIO

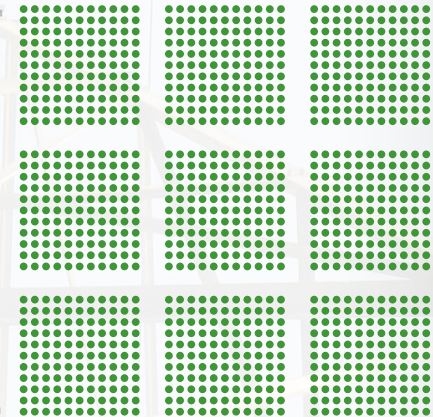


altenex®

Filters and qualifies opportunities based on buyers selection criteria/portfolio needs:

- Geography
- Technology
- Operational History
- Price

ENERGY SUPPLIERS



Fragmented universe of potential suppliers:

Developers, operators and other market participants of wind, solar, biomass and other renewable energy projects

MARKET CLARITY

When considering a renewable energy project, risk must be assessed in three primary categories (Developer, Project and Market).

Altenex has developed a proprietary Risk Analytics Engine that analyzes over 100 layers of data for each project. This brings transparency to the market and allows customers to make data driven decisions on projects that match their selection criteria. Key areas of potential risks to consider include:

DATABASE COMPONENTS

DEVELOPER	PROJECT	MARKET
<ul style="list-style-type: none"> • Operational History • Creditworthiness • Required Deal Terms • Capital Markets Relationships 	<ul style="list-style-type: none"> • Weather Patterns / Resource Availability • Local and Regional Incentives • Technology / Components / Supply Chain • Interconnection (Agreement and Status) 	<ul style="list-style-type: none"> • Fuel Mix and Emissions Profile • Transmission and Congestion • Additions & retirements of power plants • Historical and Projected Pricing

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"Altenex is the bridge GM was looking for to source large-scale renewable energy for our facilities."



"Altenex creates new ways to do business in the rapidly evolving alternative energy markets by providing more clarity, accessibility and communication between participants."



"Altenex improves our ability to identify and evaluate cost-effective clean energy projects."

